

# RUTHENIUM SILICIDE DIFFUSION BARRIER LAYERS AND METHODS OF FORMING SAME

## Abstract of the Disclosure

5 A method for use in the fabrication of integrated circuits includes providing a  
substrate assembly having a surface. A diffusion barrier layer is formed over at least a  
portion of the surface. The diffusion barrier layer is formed of  $\text{RuSi}_x$ , where  $x$  is in the  
range of about 0.01 to about 10. The barrier layer may be formed by depositing  $\text{RuSi}_x$   
by chemical vapor deposition or the barrier layer may be formed by forming a layer of  
ruthenium relative to a silicon containing region and performing an anneal to form  
10  $\text{RuSi}_x$  from the layer of ruthenium and the silicon containing region. Capacitor  
electrodes, interconnects or other structures may be formed with such a diffusion barrier  
layer.

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# **DEVICE STRUCTURES INCLUDING RUTHENIUM SILICIDE DIFFUSION BARRIER LAYERS**

## **Abstract of the Disclosure**

A device structure including a substrate assembly having a surface. A diffusion barrier layer is formed over at least a portion of the surface. The diffusion barrier layer is formed of

5 RuSi<sub>x</sub>, where x is in the range of about 0.01 to about 10. Capacitor electrodes, interconnects or other structures may be formed with such a diffusion barrier layer.